

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 21, 1996
Date Received: August 13, 1996
Project: 4700 Colorado ID, PO #M54190
Date Samples Extracted: August 13, 1996
Date Extracts Analyzed: August 14, 1996

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE
FOR TOTAL METALS BY
INDUCTIVELY COUPLED PLASMA (ICP)
(METHOD 6010)**

**Samples Processed Using Method 3050
Results Reported as $\mu\text{g/g}$ (ppm)**

<u>Sample ID</u>	<u>M54190</u>	<u>Method Blank</u>
Analyte:		
Arsenic	54	<5
Barium	72	<10
Cadmium	11	<1
Chromium	320	<1
Lead	170	<2
Selenium	<5	<5
Silver	<1	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 21, 1996

Date Received: August 13, 1996

Project: 4700 Colorado ID, PO #M54190

**QUALITY ASSURANCE RESULTS
FOR TOTAL METALS BY
INDUCTIVELY COUPLED PLASMA (ICP)
(METHOD 6010)**

Laboratory Code: 71465 (Duplicate)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Relative Percent Difference</u>
Arsenic	ug/g (ppm)	54	62	14
Barium	ug/g (ppm)	72	64	12
Cadmium	ug/g (ppm)	11	22	67
Chromium	ug/g (ppm)	320	430	29
Lead	ug/g (ppm)	170	130	27
Selenium	ug/g (ppm)	<5	<5	nm
Silver	ug/g (ppm)	<1	<1	nm

Laboratory Code: 71465 (Matrix Spike)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>% Recovery</u>		<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
				<u>MS</u>	<u>MSD</u>		
Arsenic	ug/g (ppm)	100	54	86	95	50-150	10
Barium	ug/g (ppm)	50	72	ai	ai	50-150	ai
Cadmium	ug/g (ppm)	50	11	65	65	50-150	0
Chromium	ug/g (ppm)	50	320	ai	ai	50-150	ai
Lead	ug/g (ppm)	100	170	ai	ai	50-150	ai
Selenium	ug/g (ppm)	100	<5	73	71	50-150	3
Silver	ug/g (ppm)	20	<1	69	70	50-150	1

Laboratory Code: Spike Blank

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>% Recovery</u>		<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
			<u>MS</u>	<u>MSD</u>		
Arsenic	ug/g (ppm)	100	95	91	80-120	4
Barium	ug/g (ppm)	50	116	99	80-120	16
Cadmium	ug/g (ppm)	50	102	96	80-120	6
Chromium	ug/g (ppm)	50	102	104	80-120	2
Lead	ug/g (ppm)	100	105	98	80-120	7
Selenium	ug/g (ppm)	100	102	96	80-120	6
Silver	ug/g (ppm)	20	91	88	80-120	3

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

ai - The amount spiked was insufficient to give meaningful recovery data.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 21, 1996
Date Received: August 13, 1996
Project: 4700 Colorado ID, PO #M54190
Date Samples Extracted: August 16, 1996
Date Extracts Analyzed: August 16, 1996

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE
FOR TOTAL MERCURY BY COLD VAPOR AA**

Samples Processed Using Method 7471A
Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u>	<u>Mercury</u>
M54190	0.09
Method Blank	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 21, 1996

Date Received: August 13, 1996

Project: 4700 Colorado ID, PO #M54190

**QUALITY ASSURANCE RESULTS
FOR Mercury by Cold Vapor AA
(METHOD 7471A)**

Laboratory Code: 71450 (Duplicate)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Relative Percent Difference</u>
Mercury	µg/g (ppm)	0.08	0.07	13 a

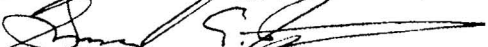
Laboratory Code: Spike Blank

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>% Recovery</u>		<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
			<u>MS</u>	<u>MSD</u>		
Mercury	µg/g (ppm)	0.3	105	103	80-120	2



a - The analyte was detected at a level less than five times the detection limit. The RPD results may not provide reliable information on the variability of the analysis.

~~DTB~~ kJ
AI
8.13.96
9:50 AM

Send Report To:

SITE NO.		PROJECT NAME		PURCHASE ORDER #	
		4700 Colorado ID		M 54120	
SAMPLERS (signature)			PROJECT LOCATION		
			4700 Colorado		
REMARKS			SAMPLE DISPOSAL INFORMATION		
			<input type="checkbox"/> Dispose after 30 days <input checked="" type="checkbox"/> Return Samples <input type="checkbox"/> Call for Instructions		

[illegible]

SIGNATURE	PRINT NAME	COMPANY	Date	Time
Relinquished by: 	GERALD A. Thompson	ACW	8/12/96	9:23 AM
Received by: 	KURT JOHNSON	FB & I	8/13/96	9:23 AM
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D
Beth M. Albertson, M.S.
Bradley T. Benson
Kelley D. Wilt

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044

August 21, 1996

**INVOICE # 96ACU0821-1
DUPLICATE COPY**

Accounts Payable
Alaskan Copper Works
628 South Hanford
Seattle, WA 98134

RE: Project 4700 Colorado ID, PO #M54190: Results of testing requested by
Gerry Thompson, Project Manager for material submitted on August 13,
1996.

1 soil sample analyzed for Total Metals by Method 6010 @ \$95 per sample	\$ 95.00
1 soil sample analyzed for Mercury by cold vapor @ \$35 per sample	<u>35.00</u>
Amount Due	\$ 130.00

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3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044

August 21, 1996

**Gerry Thompson, Project Manager
Alaskan Copper Works
628 South Hanford
Seattle, WA 98134**

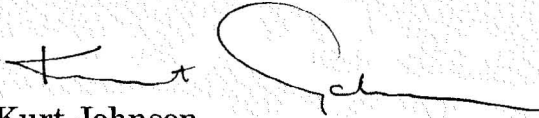
Dear Mr. Thompson:

**Enclosed are the results from the testing of material submitted on August 13, 1996
from your 4700 Colorado ID, PO #M54190 project.**

**We appreciate this opportunity to be of service to you and hope you will call if you
should have any questions.**

Sincerely,

FRIEDMAN & BRUYA, INC.


**Kurt Johnson
Chemist**

**keh
Enclosures
ACU0821R.DOC**